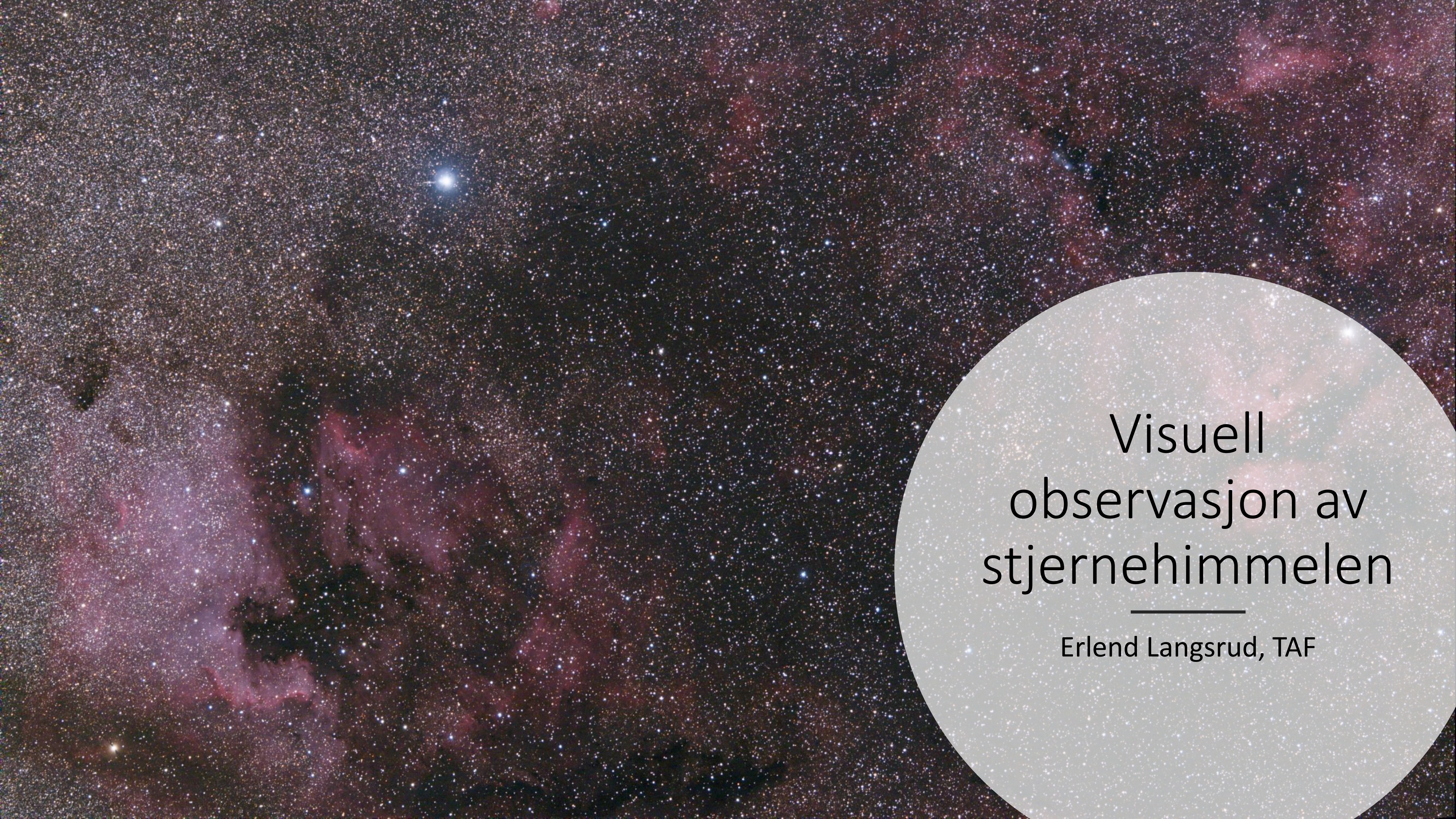


Visuell observasjon av stjernehimmelen

Erlend Langsrud, TAF

Universet

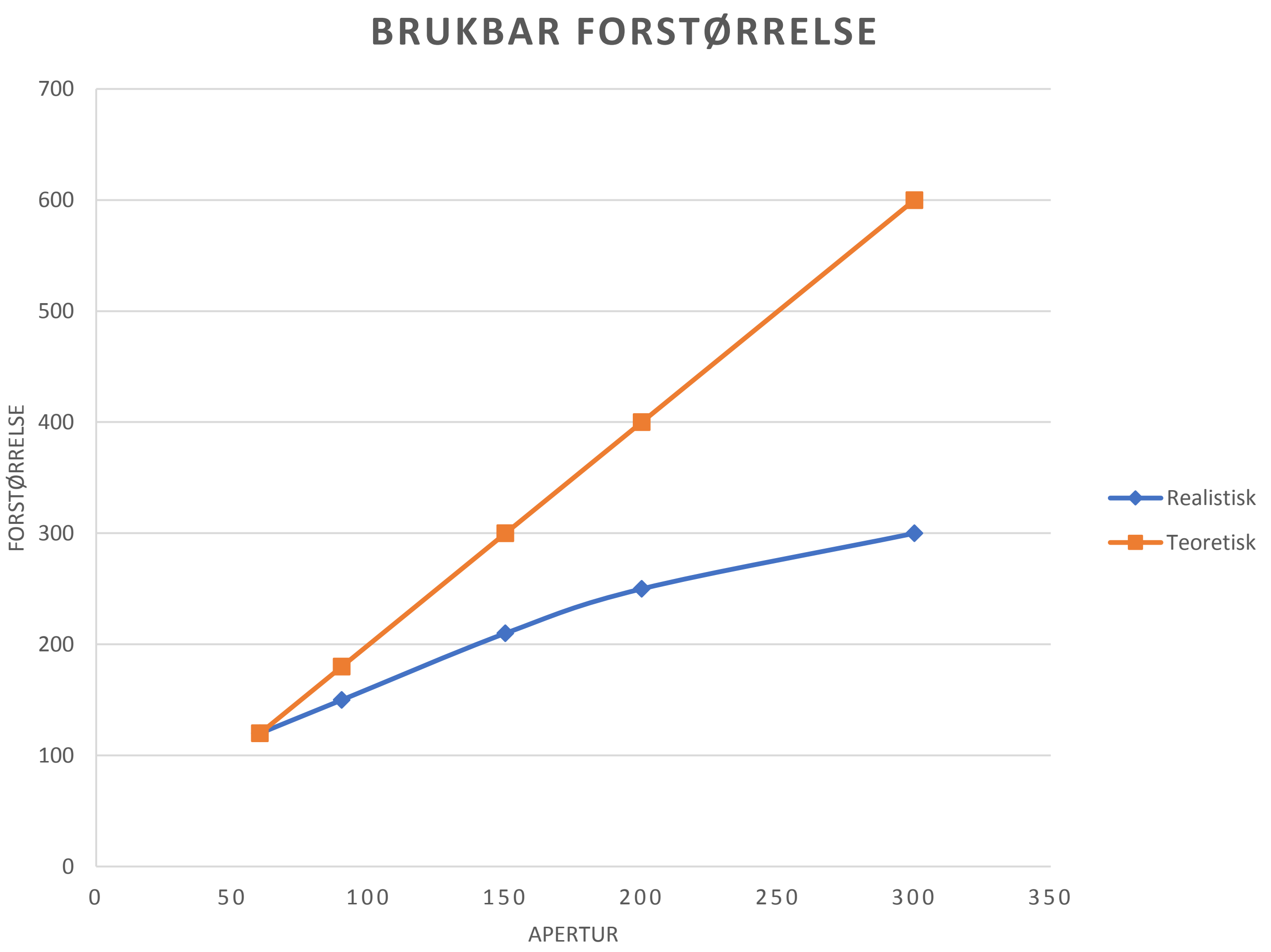
- Stort
- Langt borte
- Mørkt
- Spennende

Øyet – kikkert- teleskop

	Diameter	Teoretisk oppløsning	Samlet lys	Grense-magnitude	Teoretisk Forstørrelse
Øyet	5	60	1	7,2	1
Prismekikkert	50	6	100	13	
	60	1,9	144	12,6	120
Teleskop	90	1,3	324	13,5	180
	150	0,8	900	14,6	300
	200	0,6	1600	15,2	400
	300	0,4	3600	16,1	600





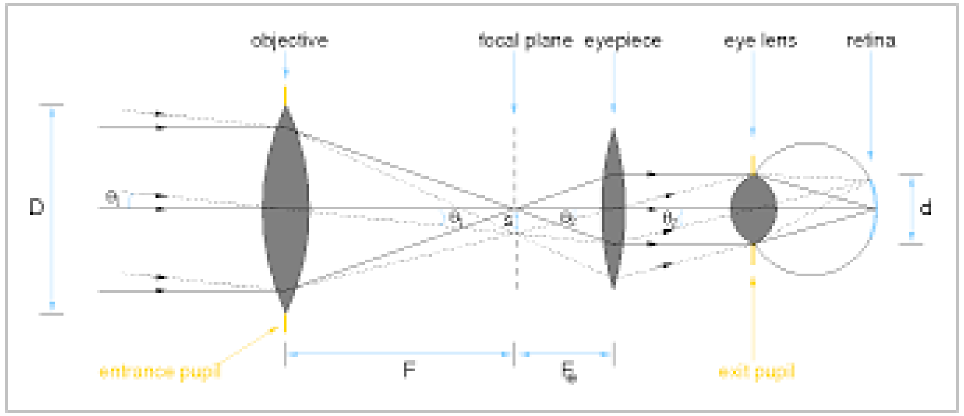


Høyeste forstørrelse begrenses av:

- Mørkere bilde (særlig planeter)
- Seeing
- Vesentlig lavere enn teoretisk for store teleskop

Laveste forstørrelse begrenses av:

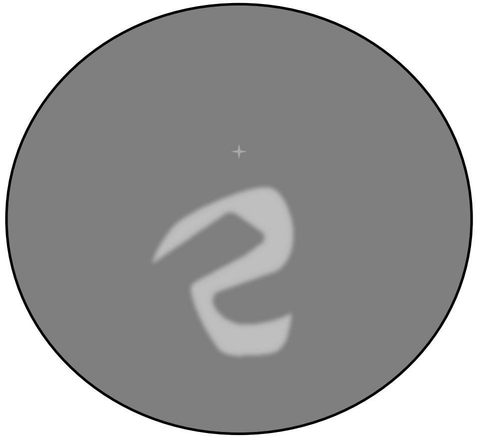
- Apertur/øyets diameter (ellers sløser man bort lys)
- Skygge fra sekundærspeil



Valg av forstørrelse

- Høy forstørrelse sprer lyset utover – gjør diffuse objekt svakere
- Høy forstørrelse gjør bakgrunnen mørkere – Konsentrerte objekt tydeligere

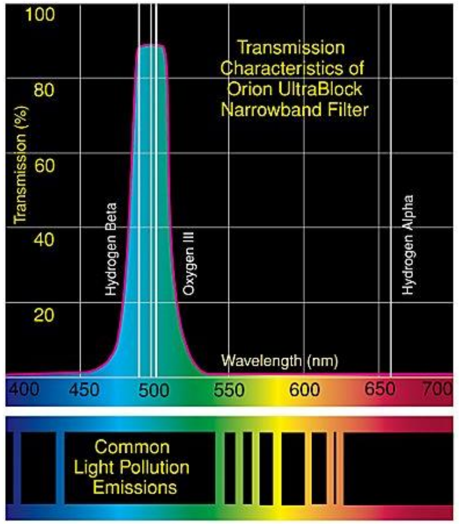
Lav forstørrelse



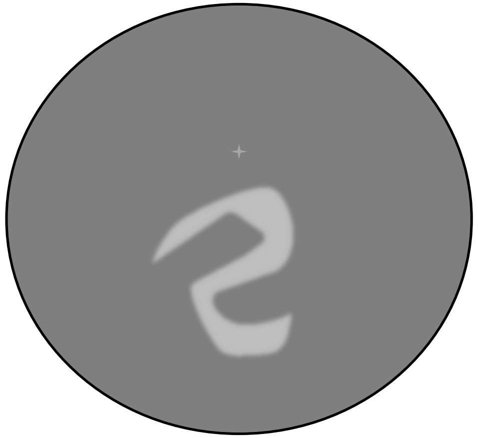
Høy forstørrelse

Lysforurensningsfilter

- Gjør bakgrunnen mørkere
- Øker kontrasten til emisjonståker



Lav forstørrelse

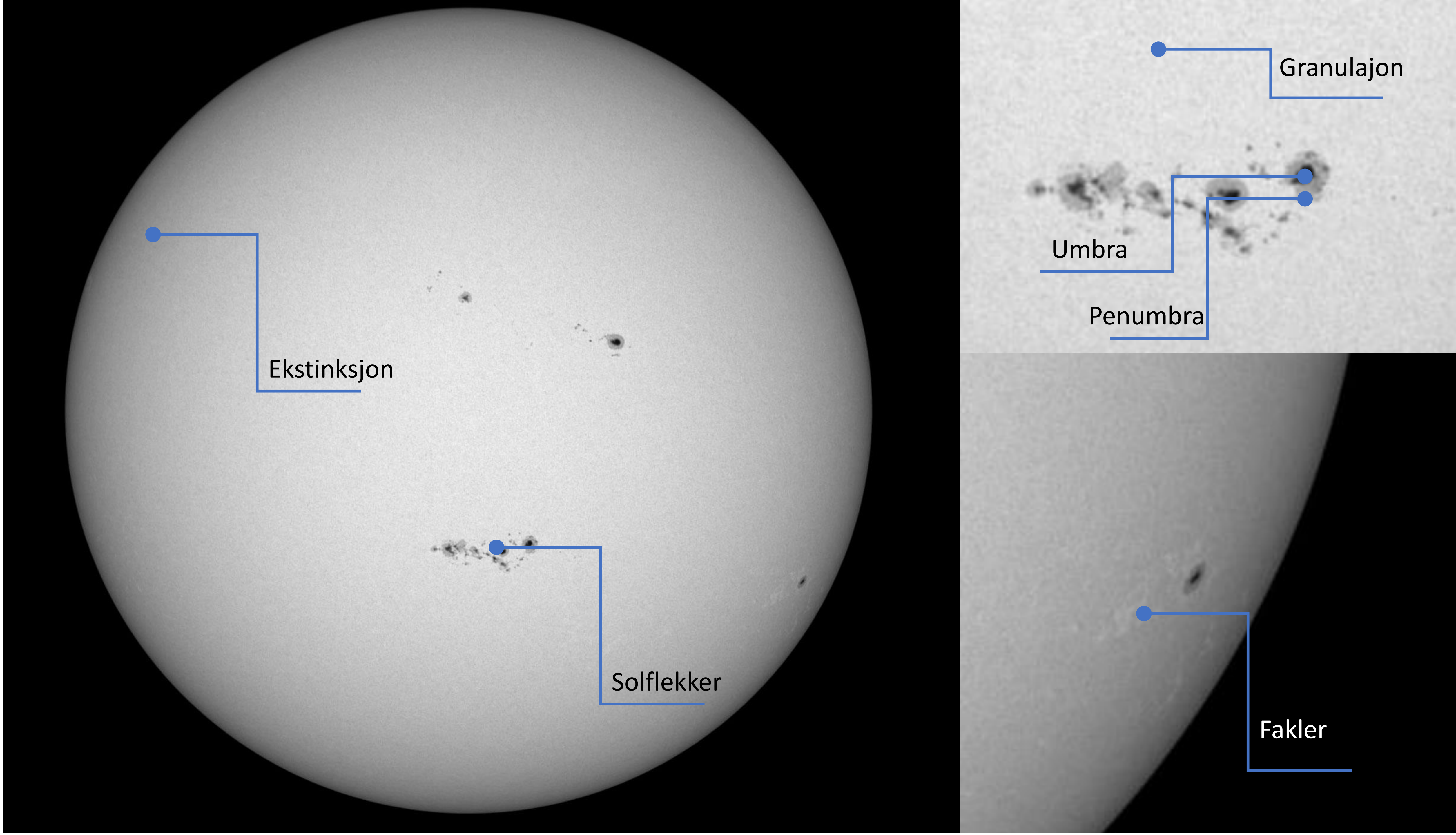


Høy forstørrelse

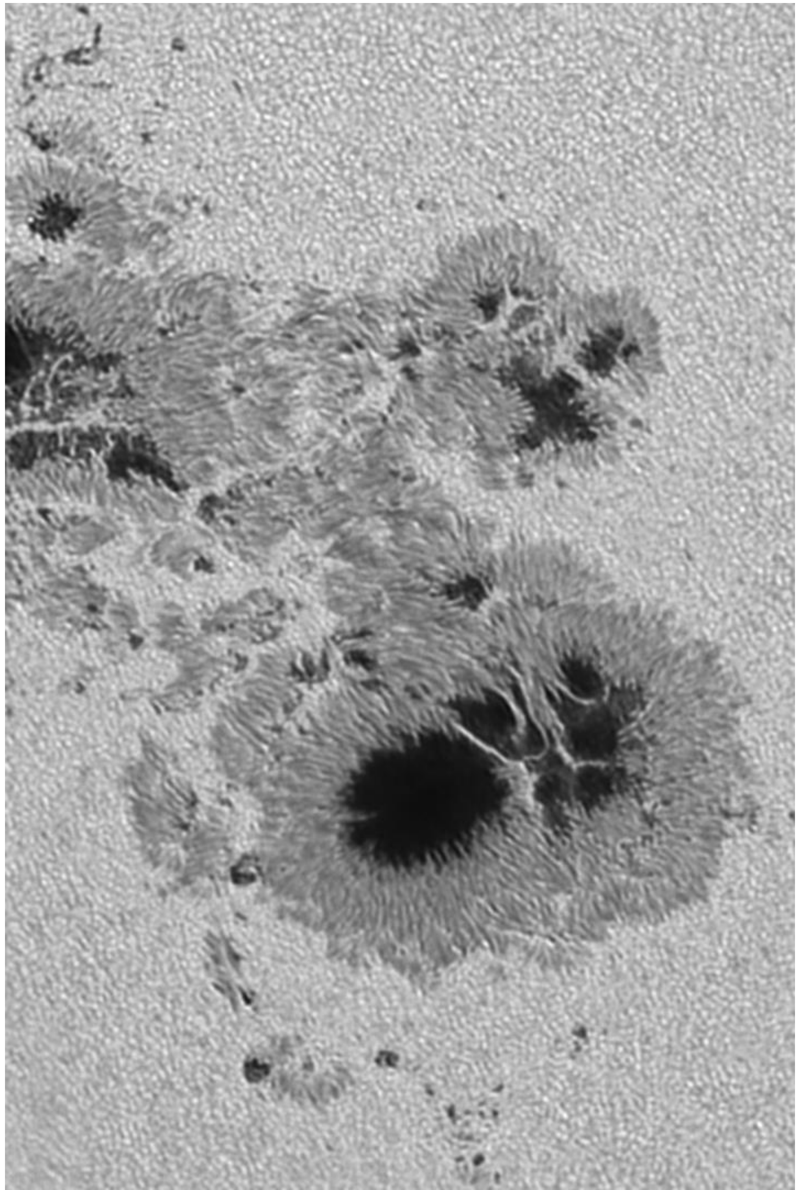
Lav forstørrelse

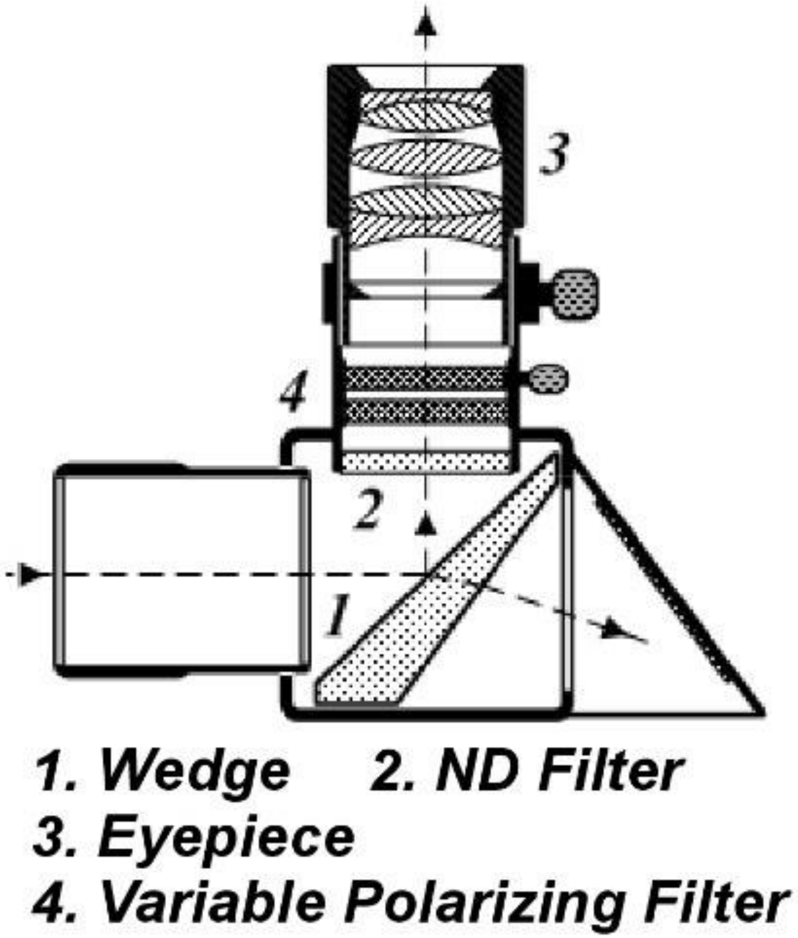
filter

Solobservasjon – vanlig lys


Ekstinksjon
Solflekker
Granulajon
Umbra
Penumbra
Fakler

Herschel Wedge





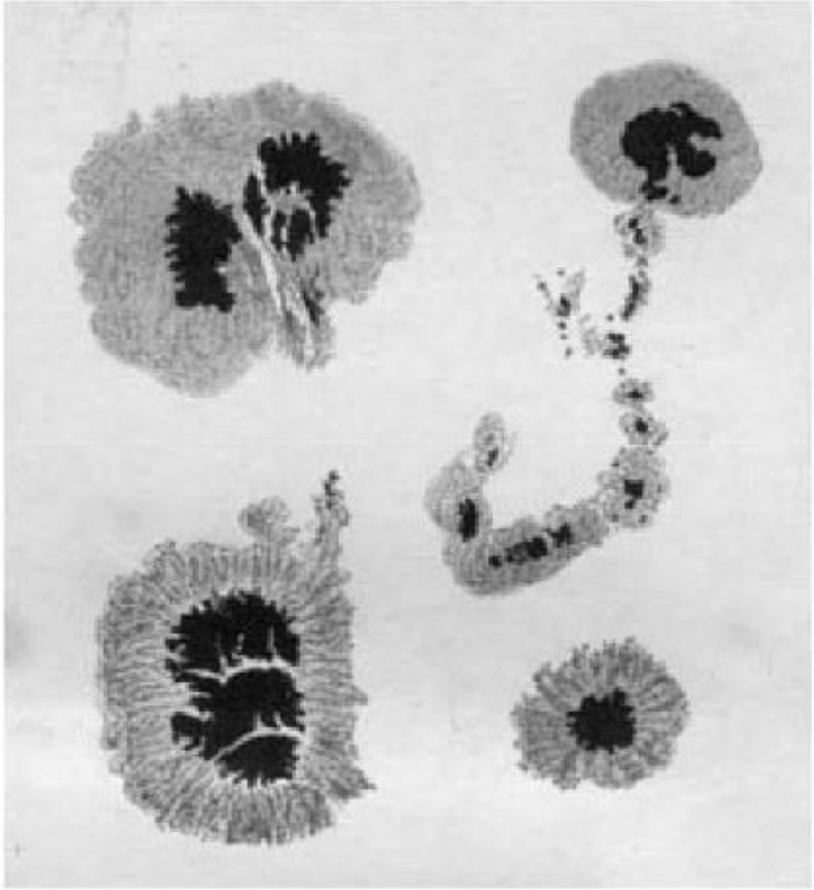
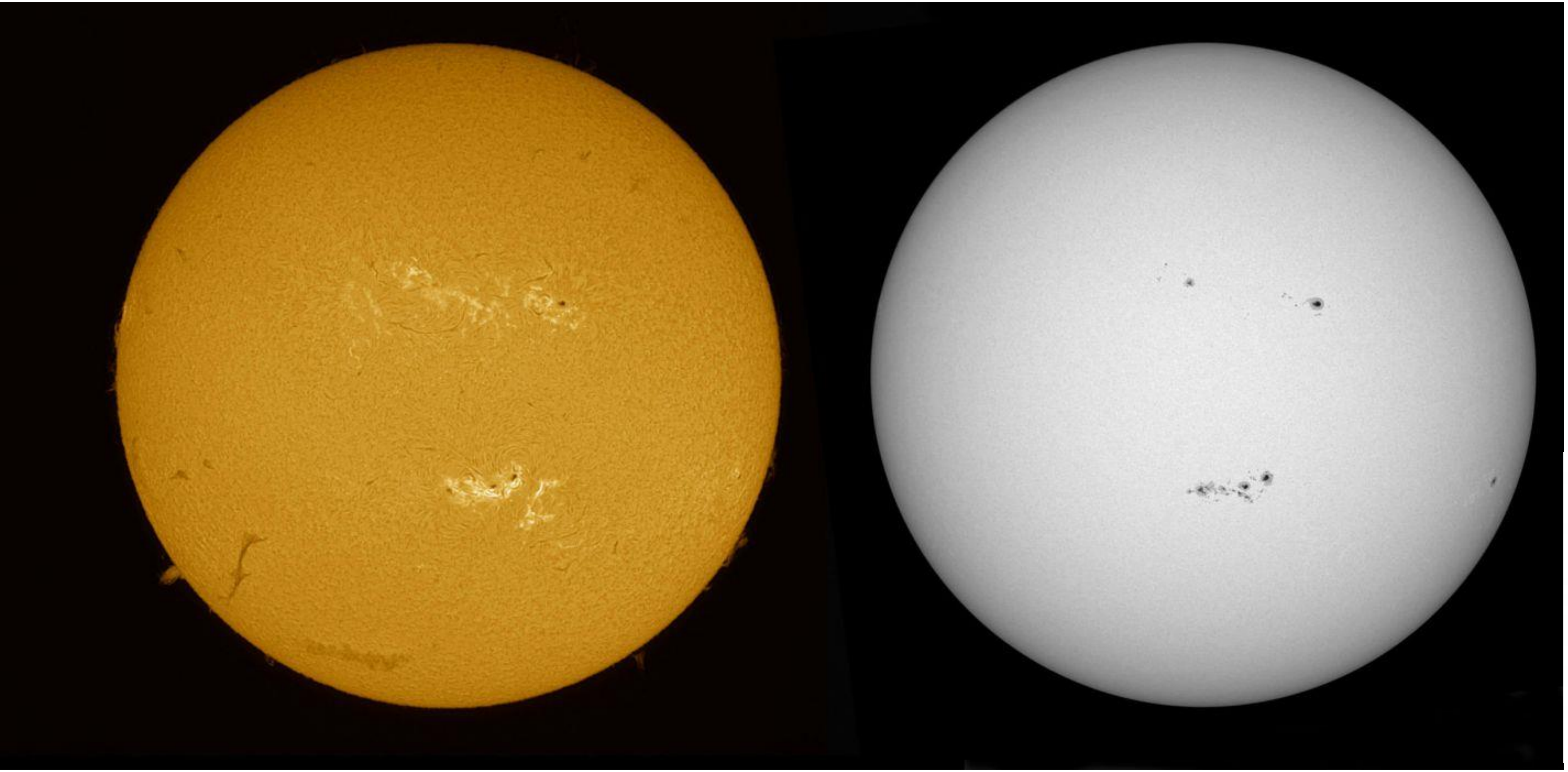


Figure 5. The Herschel Wedge: *John Herschel first proposed the idea of using a wedge to split off a safe amount of sunlight for observation (left). His resulting observation sketches are as impressive today as they were 150 years ago (right).*

H-alfa



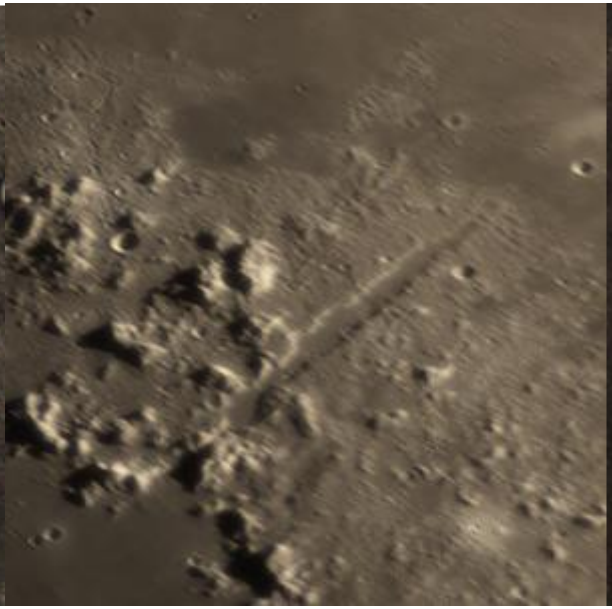
Månen

- Visuelt: Hav, faser, jordskinn. (Krater?...hm …nei)
- Prismekikkert: Kratere
- Teleskop: Forkastninger, vulkanske kupler

Ting å se

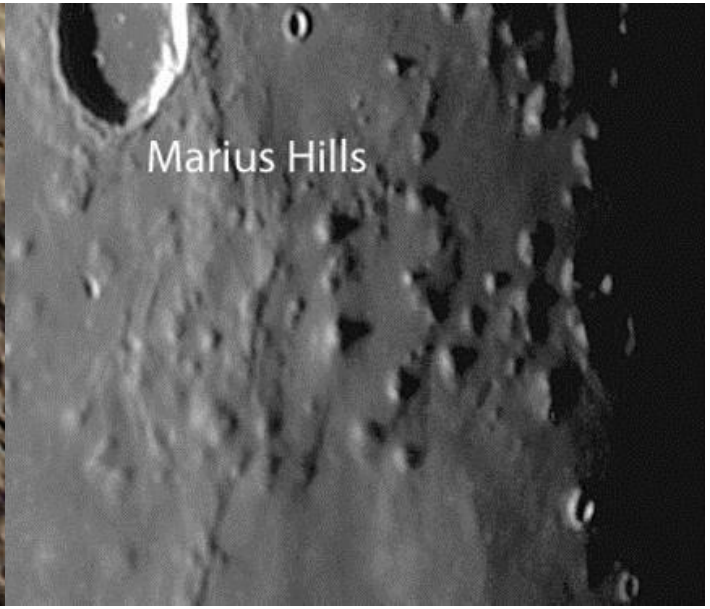
L17 Schrøters dal, riller.

L15 Straight wall
(Forkastning)



L19 Alpine valley
(graben)

L55 Davy crater chain,
rikosjett fra nedslag

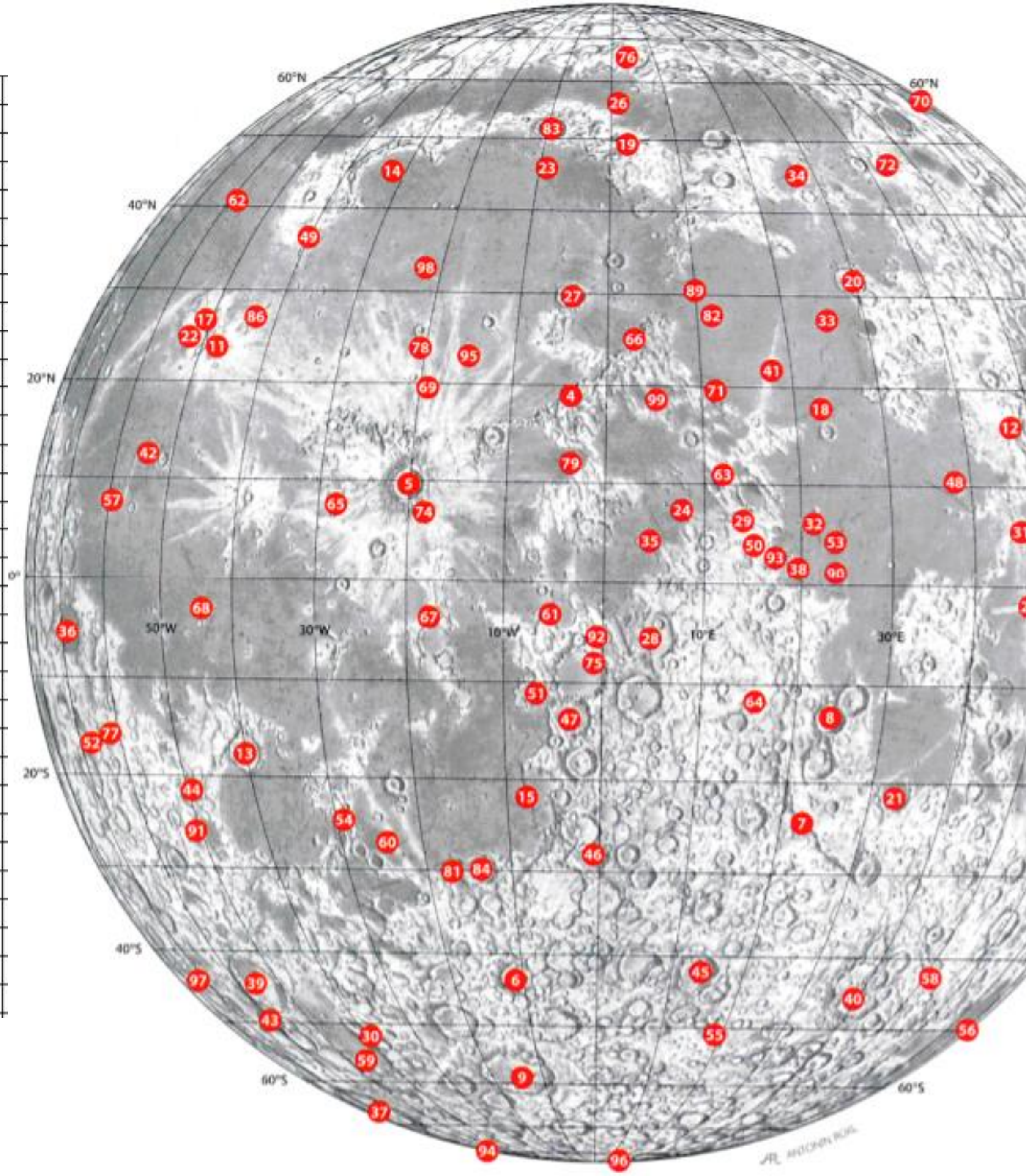


L55 marius hills
(Vulkanske kupler)

Lunar 100

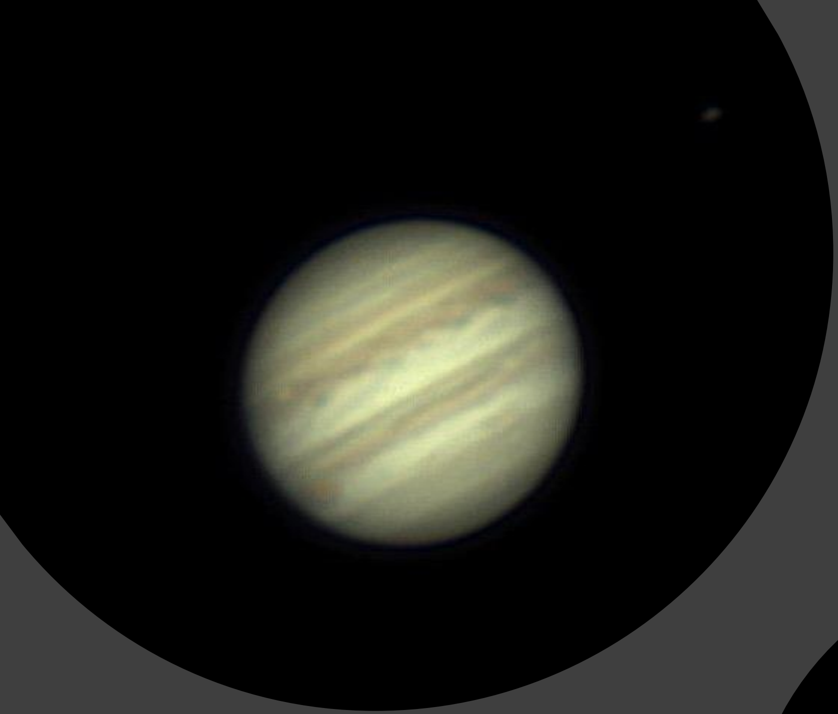
No.	Feature Name	Significance
1	Moon	Large satellite
2	Earthshine	Twice reflected sunlight
3	Mare/highland dichotomy	Two materials with distinct compositions
4	Apennines	Imbrium basin rim
5	Copernicus	Archetypal large complex crater
6	Tycho	Large rayed crater with impact melts
7	Altai Scarp	Nectaris basin rim
8	Theophilus, Cyrillus, Catharina	Crater sequence illustrating stages of degradation
9	Clavius	Lacks basin features in spite of its size
10	Mare Crisium	Mare contained in large circular basin
11	Aristarchus	Very bright crater with dark bands on its walls
12	Proclus	Oblique-impact rays
13	Gassendi	Floor-fractured crater
14	Sinus Iriuum	Very large crater with missing rim
15	Straight Wall	Best example of a lunar fault
16	Petavius	Crater with domed and fractured floor
17	Schroter's Valley	Giant sinuous rille
18	Mare Serenitatis dark edges	Distinct mare areas with different compositions
19	Alpine Valley	Lunar graben
20	Posidonius	Floor-fractured crater
21	Fracastorius	Crater with subsided and fractured floor
22	Aristarchus Plateau	Mysterious uplifted region mantled with pyroclastics
23	Pico	Isolated Imbrium basin-ring fragment
24	Hyginus Rille	Rille containing rimless collapse pits
25	Messier and Messier A	Oblique ricochet-impact pair
26	Mare Frigoris	Arcuate mare of uncertain origin
27	Archimedes	Large crater lacking central peak
28	Hipparchus	Subject of first drawing of a single crater
29	Aridaeus Rille	Long, linear graben
30	Schiller	Possible oblique impact
31	Taruntius	Young floor-fractured crater
32	Arago Alpha and Beta	Volcanic domes

http://www.spacegazer.com/Documents%5CAstronomy%20Projects%5CLunar_100_map.pdf



Planeter - Jupiter

- Visuelt: Klar, gulhvit stjerne
- I prismekikkert: 4 Galileiske måner synlige pluss utstrekning



Jupiter i teleskop

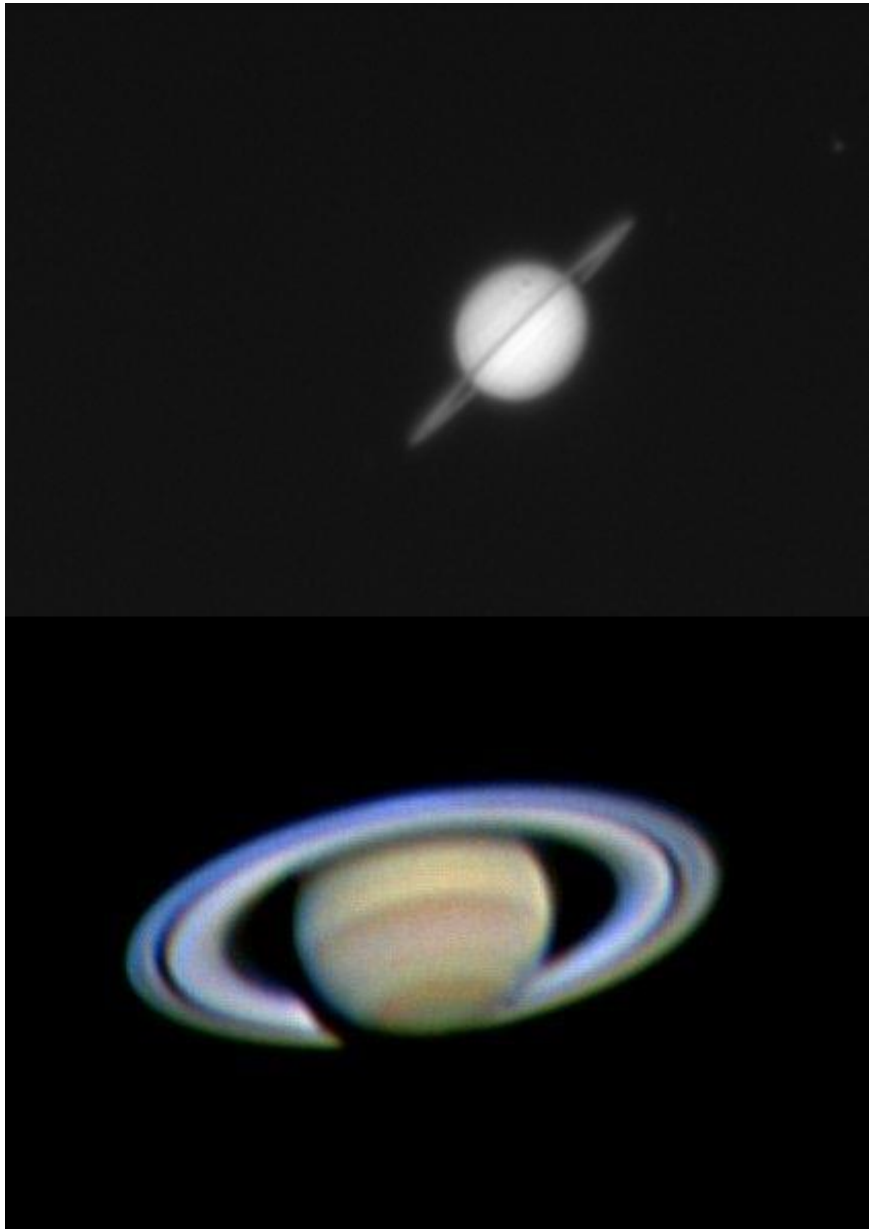
- Lite teleskop: Skybelter
- Stort teleskop: Den røde flekken ++
- Måner som passerer
- Skygger av månene
- Forandrer seg fra år til år!

Jupiter i ulike teleskop (sånn ca)

60mm teleskop 90mm 150mm 200mm 300mm

Saturn

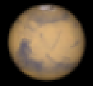
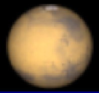
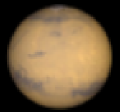
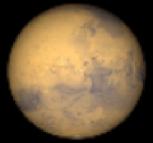
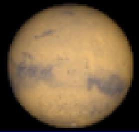
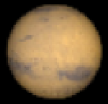
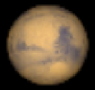
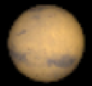
- Visuelt: Klar, gulhvit stjerne
- I prismekikkert: Oval form avhengig av vinkel
- Alle teleskop: Ringene og månen Titan
- Store teleskop: Cassinis deling



Mars

- Visuelt - Som en middels sterk rød stjerne
- Varierer fra 3,5» til 25»
- Polkalotter og hav synlig i teleskopet

Mars - opposisjoner

Opposition Date	Constellation		Declination	Apparent Magnitude	Apparent Diameter (arcsecs)	View from Earth (North up)	% of Max. Size	Distance (AU)*	
								from Earth	from Sun
2012 March 3	♌	Leo	+10°.2	-1.2	13".9		54	0.6745	1.6646
2014 April 8	♍	Vir	-5°.1	-1.5	15".1		58	0.6219	1.6226
2016 May 22	♏	Sco	-21°.6	-2.0	18".4		71	0.5101	1.5224
2018 July 27	♑	Cap	-25°.4	-2.8	24".2		94	0.3862	1.4000
2020 October 13	♓	Psc	+5°.5	-2.6	22".4		87	0.4181	1.4154
2022 December 8	♉	Tau	+24°.9	-1.8	17".0		66	0.5492	1.5340
2025 January 16	♊	Gem	+25°.1	-1.4	14".5		56	0.6435	1.6261
2027 February 19	♌	Leo	+15°.2	-1.2	13".8		54	0.6780	1.6651

- Opposisjon oktober 2020 – 17 grader over horisonten

- Opposisjon desember 2022 – 55 grader over horisonten!

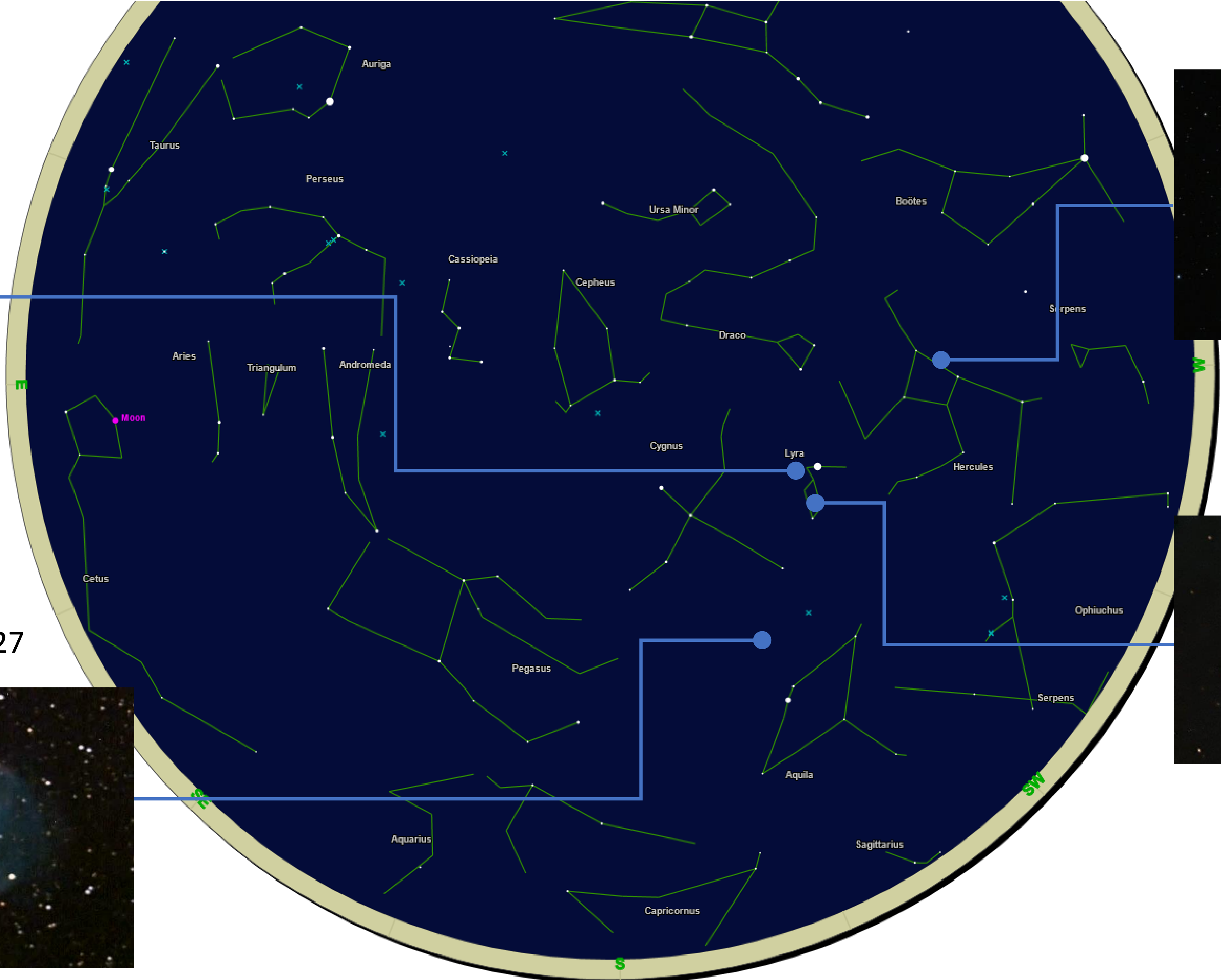
Venus

- Visuelt - Som en svært lyssterk stjerne
- Har tydelige faser
- Praktisk takt helt hvit
- Stadig vekk observerbar, som morgenstjerne eller aftenstjerne

Høst

Epsilon Lyrae

Doble doble



M13

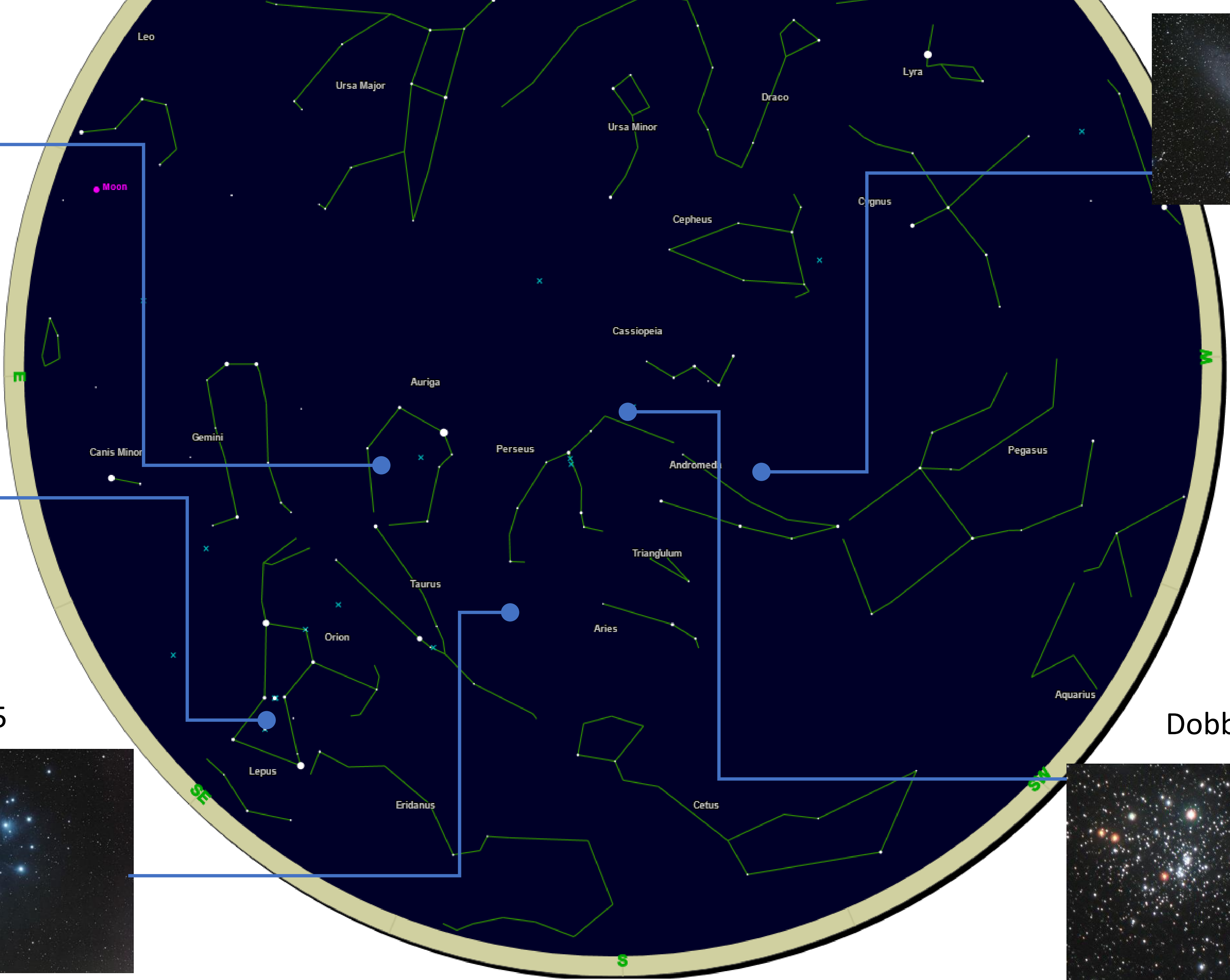
Ringtåken M27

Manualtåken M27

Vinter

M36, 37 ,38

Hopene i Auriga



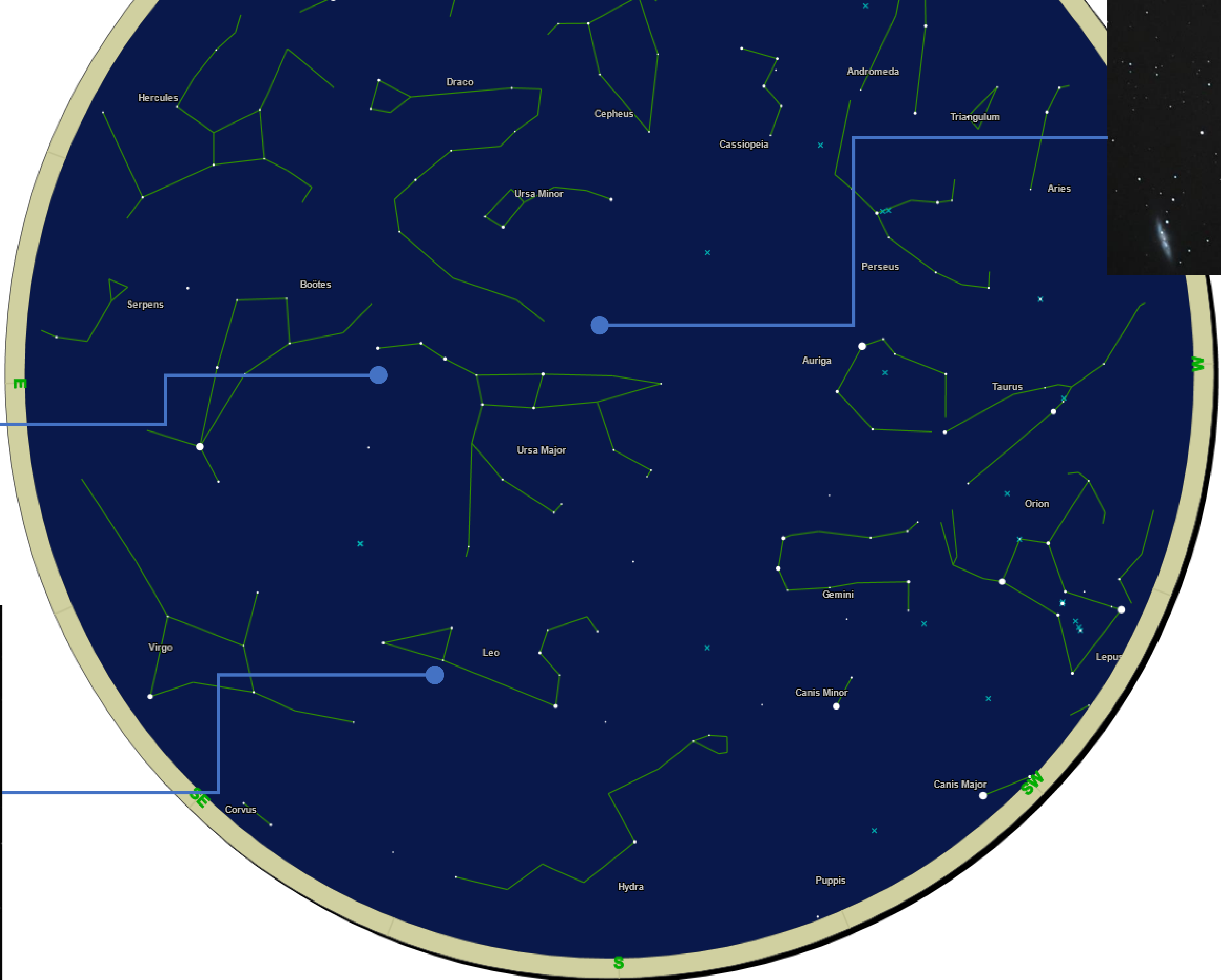
M31 Andromeda galaksen

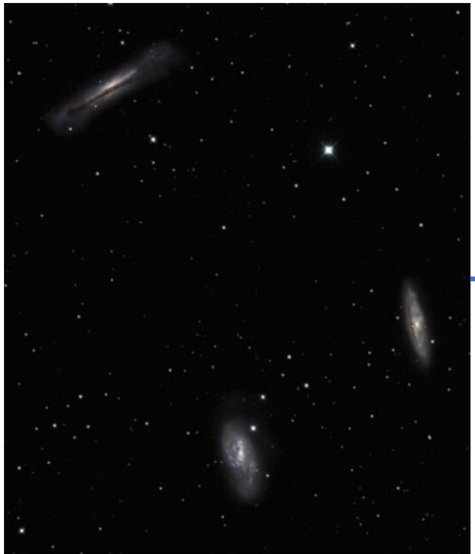
Oriontåken M42

Pleiadene M45

Dobbelthopen

Vår

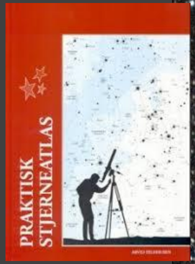




https://in-the-sky.org

Planlegging /ressurser

- På nettet:
  - In-the-sky.org
  - Lunar 100 map
- På mobilen:
  - Sky Map (Planetarium)
  - SkEye Pro (Planetatium)
- Bok
  - Praktisk stjerneatlas. Arvid Feldhusen



- Tips:
  - Varme klær!
  - Dra til utlandet